

# Population Status of *Cacatua sulphurea parvula* and *Trichoglossus euteles* in Alor, East Nusa Tenggara

**WAHYU WIDODO**

Zoology Division, Research Center for Biology, Indonesian Institute of Sciences (LIPI), Cibinong-Bogor 16911.

Received: 11<sup>th</sup> November 2008. Accepted: 23<sup>rd</sup> January 2009.

## ABSTRACT

The aim of this survey was to know the abundance status of the Yellow-crested Small Cockatoo (*Cacatua sulphurea parvula*) and Yellow-headed Lorikeet (*Trichoglossus euteles*) in Alor, East Nusa Tenggara Province. There were four observation sites in the survey, namely: (i) Air Mancur preparatory Village (in and around of Tuti Adigae Natural Tourism Park, East Alor Sub-district), (ii) Tanglapui Village (Kampong Irawuri) (East Alor Sub-district), (iii) Probur Village (Kampong Wormanem) (Southwest Alor Sub-district), and (iv) Bota Village (Northwest Alor Sub-district). The survey was used for the bird encounter rates per unit time method. The bird population was estimated by abundance score value. Fifty species of birds or 64.9% of 77 species of birds occurring in Alor were recorded during field work. The yellow-headed lorikeet observed was more abundant with five abundance score and for the numbers per 10 hours observation were 58.06. There was no yellow-crested small cockatoo observed during the survey. However, the yellow-crested small cockatoo was presumed to be present in the fields by the direct observation of old nest site of *Canarium* trees.

© 2009 Biodiversitas, Journal of Biological Diversity

**Key words:** parrot, population, *Cacatua sulphurea parvula*, *Trichoglossus euteles*, Alor.

## INTRODUCTION

Psittacidae family is a special and unique group of parrots. Indonesia has less 76 species of parrots. Most of the parrots, namely 44 species are found in the middle of Papua forests, 20 species in Maluku; 16 species in Sulawesi; 14 species in Nusa Tenggara, five species in Kalimantan, four species in Sumatra and three species in Java, Bali and Madura (Sukmantoro et al., 2007). Among the species of parrots, *Cacatua sulphurea parvula* (yellow-crested small Cockatoo) and *Trichoglossus euteles* (yellow-headed Lorikeet) are found in the territory of Nusa Tenggara, especially in Alor. Because of the diversity of the body colors and smartness of such parrots in Indonesia attract fanciers, especially foreigner. This is shown by the increasing demand for export of such birds annually to several foreign countries, such as Europe, America or Asia, including Hong Kong, Singapore, Japan, and Saudi Arabia.

In order to secure parrot export and keep their sustainability, the government c/q LIPI (the Biological Research Centre) as a scientific authority and Department of Forestry (PHKA) as the management

authority must have cooperation annually to determine the quota of catch or export of such parrots proportionally. However, due to wide spread distribution of parrots in Indonesia, the determination of such quota is sometimes less likely supported by solid data or information on their population of parrots in their natural habitat. This caused by the fact that the survey taken on the population of such parrots mostly spreading the eastern part of Indonesia encountered many constrain, especially associated with the expensive cost of transportation. Nevertheless, LIPI (the Research Center for Biology) continuously conducting surveys in the past years on the population or abundance of *Cacatua* spp., parrot species in several Indonesian territories, namely in Buton (Adhikerana et al., 1997), Masa Lembo Isles (Darjono et al., 1997), Sumba (Hartini et al., 1997), East Flores (Hartini et al., 1998), North Halmahera (Widodo, 1998), Nusa Penida, Bali (Darjono and Hartini, 1999), South Tanimbar (Widodo, 1999), Lore Lindu National Park, Central Sulawesi (Widodo, 2001), and Manusela National Park, Seram (Widodo, 2006).

In this paper, the survey findings on bird population or abundance in the territory of Alor, East Nusa Tenggara will be discussed. The specific objective of the survey is to obtain information on the population status of *Cacatua sulphurea parvula* and *Trichoglossus euteles*. In addition, this study also intended to record sources of their natural feed, resting

---

### Corresponding address:

Jl. Raya Jakarta-Bogor Km 46, Cibinong 16911  
Tel. & Fax.: +62-21-8765056 & 8765068  
e-mail: widedo\_318170@yahoo.com

trees and nesting places. This is very important to study so as the existence of such parrots as one of natural sources of economic value, will be well monitored their population and may be further utilized for conservation, not only for the benefit of Alor people, but also for the Indonesian nation in general. The data or information obtained from the survey findings may be expected to be used as advisement for its utilization.

## MATERIALS AND METHODS

**The survey location** was taken in Alor District, East Nusa Tenggara Province. There were four sites observation in the survey, namely: (i) Air Mancur preparatory Village (Tuti Adigae Natural Tourism Park, East Alor Sub-district); (ii) Tanglapui Village (Kampong Irawuri) (East Alor Sub-district); (iii) Probur Village (Kampong Wormanem) (Southwest Alor Sub-district) and (iv) Bota Village (Northwest Alor Sub-district).

**Vegetation** uniquely grown at the survey area, *Eucalyptus alba* (paper bark tree), was especially found at the conservation area of Tuti Adigae Natural Tourism Park or "Taman Wisata Alam Tuti Adigae". In addition, there were also *Schleichera oleosa* and *Canarium commune*. At the area bordering with the resident settlement around Tuti Adigae NTP area, *Leucaena glauca*, *Cassia siamea*, *Ceiba pentandra*, and *Tamarindus indica* were more dominant. At Irawuri site where it is bordered with Flores Sea, the paper bark tree was also found in abundance. The other unique plants were *Casuarina equisetifolia* and coast plant such as *Terminalia catappa* and the like. At Wormanem site, the vegetation seemed different with the two previous sites. Its vegetation consisted of forest of *Aleurites moluccana* and *Canarium commune*. In addition, *Leucaena glauca* was also introduced. Whereas the survey site at Bota area, most of observation area was taken at the beach side and the dominant plants are various species of mangrove.

**The weather condition**, especially the rainfall more often takes place during the months of November up to February or March averagely of 1140 mm per year in Alor (Enga, 1991).

**The survey method** to know the population status of *Cacatua sulphurea parvula* and *Trichoglossus euteles* found in Alor was the "bird encounter rates per unit time" (Bibby et al., 2000). This method was taken by recording total individuals of each species of parrots (Psittacidae) encountered in the surveys, but without measuring the distance of the observer to each individual bird encountered along the route or observation points. The aid employed in the observation of birds was the binocular of 8 x 30 mm. The survey findings recorded that total effective hours for the bird observation at all sites to be 31 hours.

For identification purpose of bird type species encountered during the surveys, a manual: "A Guide to the Birds of Wallacea Sulawesi, The Moluccas and Lesser Sunda Islands, Indonesia" written by Coates and Bishop (1997) was used. To know the feed source of parrots in natural habitat, the method of observation was used by "ad libitum" (Altman, 1974). This method was used conducted by observing a group of parrots doing feeding activity, then the species of trees and part of plants consumed were recorded. The bird activities in perching activities or resting at sleeping or nesting trees were also recorded. Furthermore, those plants were collected as vouchers, and made into herbarium to identify the scientific names of plants follow the classification system of Steenis et al. (2005).

**Data analysis** on the population or abundance of parrots was taken by methods of totalling the individual birds at four sites and divided them into total observation hours, then the outcome obtained would be multiplied by 10 (Bibby et al., 1998). There were five scores employed to determine the abundance of birds, namely 1 or "rare" meaning the abundance score was less than 0.1; 2 or "uncommon" if its abundance score 0.1-2.0; 3 or "frequent", if its abundance score 2.1-10.0; 4 or "common", if its abundance score 10.1-40.0; and 5 or "abundant", if its abundance score was more than 40.0.

## RESULTS AND DISCUSSION

### Abundance score

At the four survey sites, 50 species of birds (refer to Table 1) or 64.9% of all species of birds were found in Alor, where overall there were 77 species (White and Bruce, 1986).

In Table 1, it appears that the bird species included in "abundant" under score five has just totaled one species (2%), whereas included in the "rare" category under score 1 was not found in the survey. *Trichoglossus euteles* is one of two species of parrots endemic in Nusa Tenggara under total individuals per 10 observation hours were 58.06. Its abundance score was classified as the highest, so that it may be stated that *T. euteles* was the most abundant. Even though, it spread area appears unevenly. The highest abundance of *T. euteles* was found in Tuti Adigae NTP site, situated at the Air Mancur preparatory Village. In each morning observation time taken at this site, the yellow-headed lorikeet could be encountered in group up to total 40-50 birds. At Irawuri and Wormanem, the yellow-headed lorikeet was relatively less encountered just 1-2 birds. Even, the yellow-headed lorikeet could not be encountered at Bota mangrove forest. This site is not so far with the Bota settlements and its place developed into recreation areas. The abundance of the yellow-headed lorikeet in the area of Air Mancur is, among others, caused by the fact, that the area is

**Table 1.** Abundance score of species of birds in Alor during the survey.

Family	Species	Total individual birds at each sites				indi- vidual/ 10 jam	Score abun- dance
		I	II	III	IV		
Phalacrocoracidae	<i>Phalacrocorax melanoleucos</i>	0	1	0	0	0.32	2
Ardeidae	<i>Butorides striatus</i>	0	0	0	1	0.32	2
Accipitridae	<i>Elanus caeruleus</i>	2	1	0	0	0.96	2
	<i>Haliastur indus</i>	0	0	1	1	0.64	2
	<i>Accipiter fasciatus</i>	4	0	0	0	1.29	2
Megapodiidae	<i>Megapodius reinwardt</i>	0	1	2	0	0.96	2
Phasianidae	<i>Gallus varius</i>	0	0	2	0	0.64	2
Scolopacidae	<i>Actitis hypoleucos</i>	0	5	0	2	2.25	3
	<i>Numenius arquata</i>	0	0	0	1	0.32	2
	<i>Numenius phaeopus</i>	0	0	0	1	0.32	2
	<i>Gallinago megala</i>	0	0	0	6	1.93	2
Laridae	<i>Sterna bergii</i>	0	0	0	1	0.32	2
Columbidae	<i>Streptopelia chinensis</i>	4	8	4	0	5.16	3
	<i>Chalcophaps indica</i>	4	7	0	0	3.55	3
	<i>Geopelia maugei</i>	6	3	0	0	2.90	3
	<i>Ptilinopus cinctus</i>	0	2	1	0	0.96	2
	<i>Ducula aenea</i>	13	9	17	0	12.58	4
	<i>Ducula rosacea</i>	0	0	7	0	2.25	3
	<i>Macropygia magna</i>	0	3	0	0	0.96	2
Psittacidae	<i>Trichoglossus euteles</i>	160	14	16	0	58.06	5
Cuculidae	<i>Eudynamis scolopaceus</i>	2	0	1	0	0.96	2
Caprimulgidae	<i>Caprimulgus affinis</i>	4	0	0	0	1.29	2
Apodidae	<i>Collocalia esculenta</i>	6	13	14	0	10.64	4
Alcedinidae	<i>Halcyon chloris</i>	0	0	0	3	0.96	2
Meropidae	<i>Merops ornatus</i>	6	2	1	0	2.90	3
Picidae	<i>Dendrocopos moluccensis</i>	2	0	0	0	0.64	2
Hirundinidae	<i>Hirundo tahitica</i>	0	0	10	2	0.64	2
Motacillidae	<i>Motacilla cinerea</i>	1	2	0	0	0.96	2
Campephagidae	<i>Coracina personata</i>	1	0	0	0	0.32	2
Dicruridae	<i>Dicrurus densus</i>	23	13	4	0	12.9	4
Oriolidae	<i>Oriolus chinensis</i>	0	3	2	0	1.61	2
Corvidae	<i>Corvus macrorhynchos</i>	0	2	4	0	1.93	2
Paridae	<i>Parus major</i>	0	2	1	0	0.96	2
Turdidae	<i>Saxicola caprata</i>	3	0	1	0	1.29	2
Acanthizidae	<i>Gerygone sulphurea</i>	5	0	1	0	1.93	2
Monarchidae	<i>Terpsiphone paradisi</i>	2	3	0	0	1.61	2
	<i>Hypothymis azurea</i>	0	1	4	0	1.61	2
	<i>Monarcha trivirgatus</i>	1	0	0	0	0.32	2
Rhipiduridae	<i>Rhipidura rufifrons</i>	2	0	1	0	0.96	2
Pachycephalidae	<i>Pachycephala pectoralis</i>	1	2	5	0	2.58	3
Artamidae	<i>Artamus leucorhynchos</i>	0	0	3	0	0.96	2
Sturnidae	<i>Gracula religiosa</i>	0	1	2	0	0.96	2
Meliphagidae	<i>Philemon buceroides</i>	10	13	2	1	8.38	3
	<i>Lichmera indistincta</i>	3	0	1	0	1.29	2
Nectariniidae	<i>Anthreptes malacensis</i>	2	0	0	0	0.64	2
	<i>Nectarinia solaris</i>	8	8	4	1	6.77	3
Dicaeidae	<i>Dicaeum igniferum</i>	6	6	6	0	5.81	3
Zosteropidae	<i>Zosterops citrinellus</i>	2	15	3	0	6.45	3
Estrildidae	<i>Lonchura molucca</i>	4	15	3	0	7.09	3
	<i>Lonchura quanticolor</i>	0	5	0	0	1.61	2

Note: Scientific naming system of birds species follow Coates and Bishop (1997). The survey sites: (i) Tuti Adigae NTP (Air Mancur); (ii) Irawuri (Tanglapui); (iii) Wormanem (Probur); (iv) Bota.

part of the conservation site of Tuti Adigae NTP, where its existence is relatively safer and protected. In addition, the condition of vegetation for its supporting feed such as trees of *Schleichera oleosa* are flowering and its nectar is naturally the feed for the yellow-headed lorikeet in their natural habitat. At such site, the yellow-headed lorikeet is also fed on

fruits of fig *Ficus racemosa* and young fruits of *Ceiba pentandra*.

The second highest abundance score in the survey was four, namely for species of birds included under "common". Three species of bird under "common" category in the surveys were *Dicrurus densus* (12.90), *Ducula aenea* (12.58) and *Collocalia esculenta* (10.64). Whereas, there were 12 species of birds included in "frequent" category under score 3, namely: *Philemon buceroides* (8.38), *Lonchura molucca* (7.09), *Nectarinia solaris* (6.77), *Zosterops citrinellus* (6.45), *Dicaeum igniferum* (5.81), *Streptopelia chinensis* (5.16), *Chalcophaps indica* (3.55), *Geopelia maugei* (2.90), *Merops ornatus* (2.90), *Pachycephala pectoralis* (2.58), *Actitis hypoleucos* (2.25) and *Ducula rosacea* (2.25).

The rare category was not found, but most (68%) of total species observed were 34 bird species including "uncommon" category under score two. The population was not commonly found anymore, namely total individual birds encountered by every 10 observation hours was between 0.1-2.0. Such condition should get seriously attention and appropriately managed ecosystem. The future anxiety is that the population status will change, to be reduced or rare under score 1 due to the various pressures of habitat quality and quantity. In Table 1, it is in detail based on the survey result on the group of avis family (the bird group) found under category "uncommon" with score 0.1-2.0 were Phalacrocoracidae, Ardeidae, Accipitridae, Megapodiidae, Phasianidae, Scolopacidae (*Numenius arquata*, *Numenius phaeopus*, *Gallinago megala*), Laridae, Columbidae (*Ptilinopus cinctus*, *Macropygia magna*), Cuculidae, Caprimulgidae, Alcedinidae, Picidae, Hirundinidae, Motacillidae, Campephagidae, Oriolidae, Corvidae, Paridae, Turdidae, Acanthizidae, Monarchidae, Rhipiduridae, Artamidae, Sturnidae, Meliphagidae (*Lichmera indistincta*, *Anthreptes malacensis*), and Estrildidae (*Lonchura quanticolor*).

**Table 2.** Population status of *C.s. parvula* already surveyed in its several spread areas.

Sites	Coordinate		Size (km <sup>2</sup> )	Population status	References
	South Latitude	East Longitude			
Flores	8°30'	121°00'	13.540	14	Buchart et al. (1994)
Lomblen	8°25'	123°30'	329.7	Ttc	Mochtar (1989)
Adonara	8°20'	123°10'	497	Ttc	Mochtar (1989)
Solor	8°27'	123°05'	222	Ttc	Mochtar (1989)
Padar	8°40'	119°35'	20	?	PHPA/BirdLife Int'l (1998)
Rinca	8°41'	119°42'	198	?	PHPA/BirdLife Int'l (1998)
Komodo	8°36'	119°30'	340	85-90	PHPA/BirdLife Int'l (1998)
Sumbawa	8°40'	118°00'	15.255	14 Rare	Setiawan (1996)
Moyo	8°12'	117°32'	349	Near threatened 10	Johnstone et al. (1996) Johnstone et al. (1996) Setiawan et al. (2000)
Lombok	8°45'	116°30'	4.619	*	Behrens (1995)
Lembata/Larantuka	8°20'	123°02'	1.339	38	Hartini et al (1998)
Nusa Penida	8°44'	115°32'	202.84	6	Darjono and Hartini (1999)
Alor	8°15'	124°45'	2.125	80	Setiawan et al (2000)
Pantar	8°25'	124°07'	712	29	Setiawan et al (2000)
Timor (West)	10°00'	124°00'	14.395	18	Setiawan et al. (2000)

Note: Ttc = not recorded the presence of *C.s. parvula*; ? = no new clues; \* = already disappeared from Lombok.

#### **Distribution and population of *Cacatua sulphurea parvula***

The population of *C.s. parvula* in several sites that cover the canary-nut tree forest area at Tuti Adigae NTP, *Casuarina* forest along Irawuri River, candle-nut plantation at Probur Village (Wormanem) and mangrove forest at Bota, any such bird was not encountered at the time of survey. However, several trees for their nesting places could still be found at the bank of Mritang River, Kampong Wormanem, Probur Village (140-150 m above sea level). Nevertheless, some of the local hunters of birds said that the *C.s. parvula* might still be encountered about seven birds in its habitat at the bank of Us River, at Kampong Mahuwer, Mataraben Village. Based on the survey findings, it is estimated that though the *C.s. parvula* may be found in Alor, it is likely to spread out toward the most eastern part of Alor Isle (Potomana mountainous forest), according to the report of local community where its forest condition is still good. Setiawan et al. (2000) adds that the distribution and population of *C.s. parvula* in Alor was encountered along Kalabahi or Lendola River (six birds), Adigae NTP (30 birds), along Taramana River (20 birds), Takala (six birds), Pesomu (six birds), Halerman (four birds) and Tulen Dusun II (eight birds). It is further reported that the *C.s. parvula* could be also found at Pantar under population of 29 birds, under total of 9 birds spread over at Batuputih and 20 birds at Benggonang. According to Behrens (1995), *C.s. parvula* could still be encountered in Alor and Pantar in 1994, but the total number encountered was not mentioned. Outside Alor, namely at Lomblen, Adonara and Solor in 1989, the population of *C.s. parvula* was also surveyed, but there was no *C.s. parvula* recorded (Mochtar, 1989). However, Hartini et

al. (1998) reported that *C.s. parvula* could be directly observed at Lembata Isle at dense forest habitat, plantation of Palmyra palm, candlenut and canary-nut tree. The population of *C.s. parvula* at Lembata Isle recorded was 25 birds at the territory of Nabatukan sub-district, nine birds at Labatukan sub-district, respectively two birds at Nagawuntung and Wulangginting sub-district. According to Schmutz (1977), *C.s. parvula* was in abundance in big group in Flores in the 1970s. Whereas, *C.s. parvula* could still exist in Timor,

though only several birds in 1990s (Noske, 1995). Butchart et al. (1996) stated that the highest population of *C.s. parvula* encountered in 1994 were just 14 birds at Ria (western part of Flores). The population *C.s. parvula* in Sumbawa was stated to be rare, even it is reported at Selah Legium to nearly extinct, whereas at Moyo Isle included moderately common, namely encountered in small group up to five birds at rain forest habitat and gardens at Brang Kua and Tanjung Pasir (Johnstone et al., 1996).

#### **Benefit plants**

At least 26 species of plants are known to be useful as source of feed, resting and nesting trees for *C.s. parvula* and *T. euteles* in Alor (refer to Table 3). The *T. euteles* appears to more likely utilize nectar of blossoming flowers as source of their natural feed, among others, are *Sesbania grandiflora*, *Mucuna pruriens*, *Bombax valetonii*, *Ceiba pentandra*, *Schleichera oleosa*, *Barringtonia racemosa* and *Nauclea orientalis*. However, several kinds of fruits also observed are fed by the yellow-headed lorikeet. The fruit plants are *Eugenia javanica*, *Eugenia jamboloides*, *Zizyphus jujuba* and *Mangifera indica*. The observation findings indicated that the yellow-headed lorikeet is more commonly know as nectar feeder or feeding on fruits classified as soft fleshy fruit. According to Monk et al. (1997), *Trichoglossus* type genus (*T. haematodus*, *T. euteles*, *T. iris*) includes "nectarivore", where most of their sources of feed were nectar and flowery pollen in forest. Meanwhile, the yellow-crested small Cockatoo appears to make use of fruits, flowers and seeds of plants, either of soft or hard fleshy fruits as their sources of feed. This is more likely in variety than that

**Table 3.** Benefit plants for *C.s. parvula* and *T. euteles* in Alor, East Nusa Tenggara.

Family name	Species name *)	Benefit of plants for parrots in Alor			Parrots benefited from	
		SbP	PhB	PhT	C.s. p	T. e
Gramineae	<i>Andropogon sorghum</i> **	+(bj)				
Palmae	<i>Borassus flabellifer</i>	+(bh)				
Palmae	<i>Cocos nucifera</i>			+(bt)		
Araceae	<i>Amorphophallus</i> sp.***	+(bh)+(bj)				
Musaceae	<i>Musa paradisiaca</i>	+(bh)				
Casuarinaceae	<i>Casuarina equisetifolia</i>			+(bt)		
Moraceae	<i>Ficus benjamina</i> **	+(bh)	+(bt)			
Moraceae	<i>Artocarpus communis</i>	+(bh)				
Moraceae	<i>Artocarpus integra</i>	+(bh)				
Moringaceae	<i>Moringa oleifera</i> **	+(bh)+(ne)				
Caesalpiniaceae	<i>Bauhinia tomentosa</i>			+(bt)		
Caesalpiniaceae	<i>Tamarindus indica</i> **	+(bh)	+(bt)			
Papilionaceae	<i>Erythrina variegata</i>	+(ne)				
Papilionaceae	<i>Erythrina fusca</i> **	+(bu)	+(bt)			
Papilionaceae	<i>Sesbania grandiflora</i> ***	+(bh)+(ne)				
Papilionaceae	<i>Mucuna pruriens</i> ***	+(ne)				
Burseraceae	<i>Canarium oleosum</i> ***	+(bh)				
Burseraceae	<i>Canarium commune</i>	+(bh)	+(bt)			
Burseraceae	<i>Garuga floribunda</i> **		+(bt)			
Euphorbiaceae	<i>Aleurites moluccana</i> **	+(bh)				
Anacardiaceae	<i>Mangifera indica</i>	+(bh)				
Anacardiaceae	<i>Spondias pinnata</i>	+(bh)				
Sapindaceae	<i>Schleichera oleosa</i>	+(ne)				
Rhamnaceae	<i>Zizyphus jujuba</i>	+(bh)				
Bombacaceae	<i>Bombax valetonii</i>	+(ne)				
Bombacaceae	<i>Ceiba pentandra</i>	+(ne)	+(bt)			
Sterculiaceae	<i>Sterculia foetida</i> **		+(bt)			
Sterculiaceae	<i>Pterocymbium javanicum</i>		+(bt)			
Caricaceae	<i>Carica papaya</i> ***	+(bj)				
Sonneratiaceae	<i>Duabanga moluccana</i> **		+(bt)			
Lecythidaceae	<i>Barringtonia racemosa</i>	+(ne)				
Myrtaceae	<i>Eucalyptus alba</i>		+(bt)	+(bt)		
Myrtaceae	<i>Eugenia javanica</i>	+(bh)				
Myrtaceae	<i>Eugenia jamboloides</i>	+(bh)				
Sapotaceae	<i>Planchonia valida</i> ***			+(bt)		
Apocynaceae	<i>Alstonia scholaris</i> ***			+(bt)		
Rubiaceae	<i>Nauclea orientalis</i>	+(ne)				
Asclepiadaceae	<i>Calotropis gigantea</i>	+(bh)+(bj)				
Datisceae	<i>Tetrameles nudiflora</i> **		+(bt)			

Note: \*) Classification system of scientific names of plants follow Steenis et al. (2005); \*\*) Source is from Setiawan (1996). \*\*\*) Hartini et al. (1998). SbP = Source of feed; PhB = nesting trees; PhT = sleeping/perching trees; C.s.p = *Cacatua sulphurea parvula*, T.e = *Trichoglossus euteles*. Bh = fruit, bj = seed, bt = stem, ne = nectar.

the statement of Monk et al. (1997), who has classified *Cacatua sulphurea* as “granivore-arboreal”.

Several sources of references state that the nesting trees of *Cacatua sulphurea* in Nusa Penida Isle (Bali) were at *Sterculia foetida* and “kutuh” trees at the height of nesting hole above 6-10 m of ground level (Setiawan et al., 1996). *Cacatua sulphurea* was also nesting on *Tetrameles nudiflora* in Sumbawa at the height of nesting hole above 10 m of ground level. Nonetheless, based on the survey observation findings over their used nests, it appears that cakatua in Alor seems to choose holes on still live canary-nut

trees. The height of holes for nests of such cakatua is situated at the height of 20 m above the ground level. The canary-nut tree stem of 117 cm in diameter, by the local hunters, was set up pin made of bamboo to climb up and pick up young cakatua at breeding season. According to the local hunters, usually in December the *Cacatua* pair will use such nesting hole to lay eggs and raise young cakatua after incubating and hatching periods.

In one egg laying period, it was reported that cakatua would lay two eggs. In January or February, the hunter would harvest such young cakatua because it was estimated in such months the time had arrived for young cakatua to be able to fly. According to local bird hunters, *Cacatua sulphurea parvula* were encountered its nest on canary-nut tree grown at Kampong Likuatang (West Lembur), and at Kampong Elang (Kokar). If not on canary-nut trees, the *C.s. parvula* would make nest on stem of paper bark tree, many of which were previously found at Lembur. One nesting hole would be occupied by a pair of cakatua and its two young. At the time of entrapping, the cakatua and its young would be all harvested from the nesting hole, so that the harvest system as such had threatened the conservation of cakatua in Alor, and in the territory of Nusa Tenggara in general.

In several references are also stated that the type of tree stem known as nesting place for the *C.s. parvula* are *Cocos nucifera*, *Ficus benjamina*, *Tamarindus indica*, *Ceiba pentandra*, *Pterocymbium javanicum*, *Planchonia valida* and *Alstonia scholaris*. This indicates that the nesting type for the yellow-crested small cockatoo would be in

the hard stem and soft stem as well. However, *C.s. parvula* were reported to nest generally on canary tree.

Different from the *C.s. parvula*, the *T. euteles* found at Kampong Wormanem, nest on *Eucalyptus alba* (paper bark tree) at the height of about 4 m above ground surface and about 80 cm deep. However, the nesting trees of *T. euteles* on the *Eucalyptus alba* also often used in turn by *Gracula religiosa*. However, *Gracula religiosa* also nest on candlenut and canary-nut trees.

### Trading aspect and their conservation

The trading of *C.s. parvula* is estimated to have last for sufficiently long time, though its large-scale exploitation of forest was estimated to take place in the 1980s (Setiawan et al., 2000). To anticipate the increasing possibility of *C.s. parvula* all gone from nature, such species should be also stated as globally threatened-extinct (Shannaz et al., 1995). Nevertheless, the trading of both species of parrots from Alor sometimes still maintains/exist. This case was monitored from the survey findings at several bird markets such as in Jakarta 31 birds were sold (Widodo, 2002). At several bird markets in Semarang and Surabaya, *C.s. parvula* were monitored to be two and five birds sold at Rp 300,000 up to Rp 400,000 per bird. The period of 1997-2001, the trading of *C. sulphurea* in Medan, 400 birds were recorded (Shepherd et al., 2004). The luster of trading of *C. sulphurea* in Medan seems to be induced by demand for meeting the needs of local markets as well as traders from Singapore and Malaysia. This condition is different from the trading of *T. euteles*, which appears to be relatively less in number, namely monitored just five birds at exporter level in Jakarta within the period of April 1999 up to December 2000, and in Medan 11 birds within the period of 1997-2001 (Shepherd et al., 2004).

Viewed from the catch quota of the yellow-crested small Cockatoo from year in year out has been likely decreased in number (refer to Table 4).

**Table 4.** Total catch quota of the yellow-crested small cockatoo for export by 1984-1991\*).

Years	<i>C.s. parvula</i> (NTT)	<i>C.s. parvula</i> (NTB)	(birds)
1984	2250	625	2875
1985	1500	500	2000
1986	-	-	-
1987	550	250	800
1988	550	250	800
1989	725	300	1025
1990	1100	265	1365
1991	2950	-	2950
Total	9625	2190	11815

Note: \*) PHPA/BirdLife-IP (1998).

The decrease in total catch quota of the yellow-crested small cockatoo is foreseen as relating to the increasing difficulty of such commodities entrapped from its habitat. This is supported by the fact that based on the monitoring on population study of the yellow-crested small cockatoo in its habitat in the 1995s was began to be rare, even one bird could not be encountered in its previous habitat. According to Trainor (2002), that the biggest threat against the habitat and the species in Nusa Tenggara was illegal logging, forest fire, expansion of plantation cultivation area, considerable chopping down of grazing and hunting. It should be immediately followed with

concrete step by the government, that the disappearance of the habitat and forest degradation in Nusa Tenggara and the impact of bird utilization accompanied by the uncontrolled catches that has caused several types of such natural resource extinct could be avoided. On the other side, *Cacatua sulphurea* has been included in the protected species based on the Decree of the Minister of Forestry of Republic of Indonesia as spelt out under No. 350/Kpts-II/1997 and No. 522/Kpts-II/1997 on the utilization of wild flora and fauna. The yellow-headed Lorikeet is included under protected species. This is verified further under Government Regulations No 7 of 1999 on the Conservation of Species of Plants and Fauna. Fauna has been categorized as extinct-threatened species should there have been any special treatment with tight rules. In article 11, paragraph one of Government Regulation of the Republic of Indonesia No. 8 of 1999, it is elucidated that the breeding outcome of any wild animal that may be used for commercial purpose shall be the second and it's following generations.

## CONCLUSION

The survey findings of two species of parrots found in Alor appear that just the yellow-headed Lorikeet (*Trichoglossus euteles*) directly encountered fewer than five abundance score and total individual per 10 observation hours has been 58.06. Whereas, the yellow-crested small Cockatoo (*Cacatua sulphurea parvula*) could be directly encountered, but identified from the trees used for its nesting place, namely on canary-nut trees at the bank of Mritang River, Kampong Wormanem, Probur Village,.

The recommendation for cultivating the population of the *Cacatua sulphurea parvula* should enjoy a robust priority in West Nusa Tenggara and East Nusa Tenggara. The restoration of species should be immediately followed up, as its current population has been very small in number.

## REFERENCES

- Adhikerana, A.S., A. Saim, M. Muslihun dan M. Amir. 1997. *Status Burung Paruh Bangkok di Pulau Buton*. [Laporan Teknik Proyek Litbang dan Pendayagunaan Biota Darat Tahun 1996/1997]. Bogor: Puslitbang Biologi-LIPI.
- Altman, J. 1974. Observational study of behaviour: sampling methods. *Behaviour* 49: 227-265.
- Behrens, S. 1995. Ein hilf r f r den gelbwangenkakadu *Cacatua sulphurea*. *Papageien* 8: 280-285.
- Bibby, C.J., M. Jones and S. Marsden. 1998. *Expedition Field Techniques, Bird Surveys*. London: Royal Geographical Society.
- Bibby, C.J., N.D. Burgess, D.A. Hill and S. Mustoe. 2000. *Bird Census Techniques*. 2<sup>nd</sup> ed. London: Academic Press.
- Buchart, S.H.M., T.M. Brooks, C.W.N. Davies, G. Dharmaputra, G.C.L. Dutton, J.C. Lowen, and A. Sahu. 1996. The conservation status of forest birds on Flores and Sumbawa, Indonesia. *Bird Conservation International* 6: 335-370.

- Coates, B.J. and K.D. Bishop. 1997. *A Guide to the Birds of Wallacea Sulawesi, The Moluccas and Lesser Sunda Islands, Indonesia*. Alderley: Dove Publications.
- Darjono dan S. Hartini. 1999. *Survei Burung Kakatua-putih jambul-kuning (Cacatua sulphurea) di Nusa Penida, Bali*. [Laporan Teknik Proyek Litbang dan Pendayagunaan Biota Darat Tahun 1998/1999]. Bogor: Puslitbang Biologi-LIPI.
- Darjono, S. Hartini, Suparno, A. Sujadi dan I. Setiawan. 1997. *Survey Burung Cacatua sulphurea abboti (Psittacidae) di Pulau Masakaming, Kep. Masalembu, Kab. Sumenep, Prop. Jawa Timur*. [Laporan Teknik Proyek Litbang dan Pendayagunaan Biota Darat Tahun 1996/1997]. Bogor: Puslitbang Biologi-LIPI.
- Enga, A.H. 1991. *Welcome to the Island of Moko drums, A Guide Book for Touring in Kabupaten Alor*. Kalabahi: Bapparda TK II Alor.
- Hartini, S., D. Astuti, Suparno dan M. Amir. 1998. *Burung Paruh Bengkok di Kabupaten Flores Timur, Nusa Tenggara Timur*. [Laporan Teknik Litbang Model dan Teknik Penangkaran Satwa Langka (Burung Paruh Bengkok) Tahun 1997/1998]. Bogor: Puslitbang Biologi-LIPI.
- Hartini, S., Darjono, W. Widodo, Suparno, M. Amir dan I. Setiawan. 1997. *Burung-burung Paruh Bengkok (Psittacidae) di Pulau Sumba, Nusa Tenggara Timur*. [Laporan Teknik Proyek Litbang dan Pendayagunaan Biota Darat Tahun 1996/1997]. Bogor: Puslitbang Biologi-LIPI.
- Johnstone, R.E., P. Jepson, S.H.M. Butchart, J.C. Lowen and D. Prawiradilaga. 1996. The birds of Sumbawa, Moyo and Sangeang Islands, Nusa Tenggara, Indonesia. *Records of the Western Australian Museum* 18: 157-178.
- Mochtar, D. 1989. *Laporan Inventarisasi Satwa Liar Kakatua Jambul Kuning (Cacatua sulphurea) dan Beo (Gracula religiosa) di Kabupaten Flores Timur*, Kupang: Perlindungan Hutan dan Pelestarian Alam.
- Monk, K.A., J. de Fretes, and G. Reksodiharjo-Lilley. 1997. *The Ecology of Nusa Tenggara and Maluku*. Singapore: Periplus Editions (HK) Ltd.
- Noske, R.A. 1995. At the crossroads of two avifaunas-Timor. *Oriental Bird Club Bulletin* 21: 34-38.
- PHPA/BirdLife-IP, 1998. *Rencana Pemulihan Kakatua-kecil Jambul-kuning*. Bogor: PHPA/BirdLife International-Indonesia Programme.
- Schmutz, E. 1977. *Die vögel der Manggarai (Flores), 2*. Niederschrift. Privately published, Ruteng, Flores.
- Setiawan, I. 1996. *Status Cacatua sulphurea di Pulau Nusa Penida, Bali dan Pulau Sumbawa, Nusa Tenggara Barat*. Bogor: PHPA/BirdLife International-Indonesia Programme (Laporan no. 6).
- Setiawan, I., A. Jati, D. Lesmana, C. Trainor dan D. Agista. 2000. *Telaah Awal Status dan Penyebaran Kakatua-kecil Jambul-kuning (Cacatua sulphurea parvula) di Pulau Alor, Pantar, Timor Barat, Flores dan Moyo*. Bogor: PKA/BirdLife International-Indonesia Programme (Laporan No. 12).
- Shannaz, J. P. Jepson dan Rudyanto. 1995. *Burung-burung Terancam punah di Indonesia*. Bogor: PHPA/BirdLife International-Indonesia Programme.
- Shepherd, C.R., J. Sukumaran and S.A. Wich. 2004. *Open Season: An Analysis of the Pet Trade in Medan, Sumatra 1997-2001*. Petaling Jaya, Selangor: Traffic Southeast Asia.
- Steenis, C.G.G.J van. 2005. *Flora untuk Sekolah di Indonesia*. Jakarta: PT Pradnya Paramita.
- Sukmantoro, W., M. Irham, W. Nuvarino, E. Hasudungan, N. Kemp and M. Muchtar. 2007. *Daftar Burung Indonesia no.2*. Bogor: Indonesia Ornithologist's Union.
- Trainor, C.R. 2002. Birds of Gunung Tambora, Sumbawa, Indonesia: effects of altitude, the 1815 cataclysmic volcanic eruption and trade. *Forktail* 18: 49-61.
- White, C.M.N. and M.D. Bruce. 1986. *The Birds of Wallacea (Sulawesi, The Moluccan and Lesser Sunda Island, Indonesia). An Annotated Checklist*. BOU. Checklist No.7. Bogor: British Ornithologist's Union.
- Widodo, W. 1998. Kelimpahan, habitat dan pakan alami burung-burung paruh bengkok (Psittacidae) di Halamhera Utara. *Ekologi Indonesia* 2 (3): 12-18.
- Widodo, W. 1999. Kelimpahan dan pakan alami burung-burung paruh bengkok (Psittacidae) di Tanimbar Selatan. *Gakuryoku* 5 (3): 169-175.
- Widodo, W. 2001. Studi populasi burung-burung paruh bengkok (Psittacidae) di Taman Nasional Lore Lindu, Sulawesi Tengah. *Gakuryoku* 7 (1): 75-80.
- Widodo, W. 2002. Perdagangan Burung Paruh Bengkok (suku Psittacidae) di Jabotabek. *Seminar Nasional IX PERSADA*. IPB Baranangsiang, Bogor, 19 Maret 2002.
- Widodo, W. 2006. Kemelimpahan dan sumber pakan burung-burung di Taman Nasional Manusela, Seram, Maluku Tengah. *Biodiversitas* 7(1): 54-58.